



## ***LITTLE AMERICA DEVELOPMENT***

***537 Acre Development Project  
Analysis September 2013***

### ***Public Water & Sewer Impact Analysis***

Prepared by the Civil Design & Engineering, Inc. for Utilities Department COF

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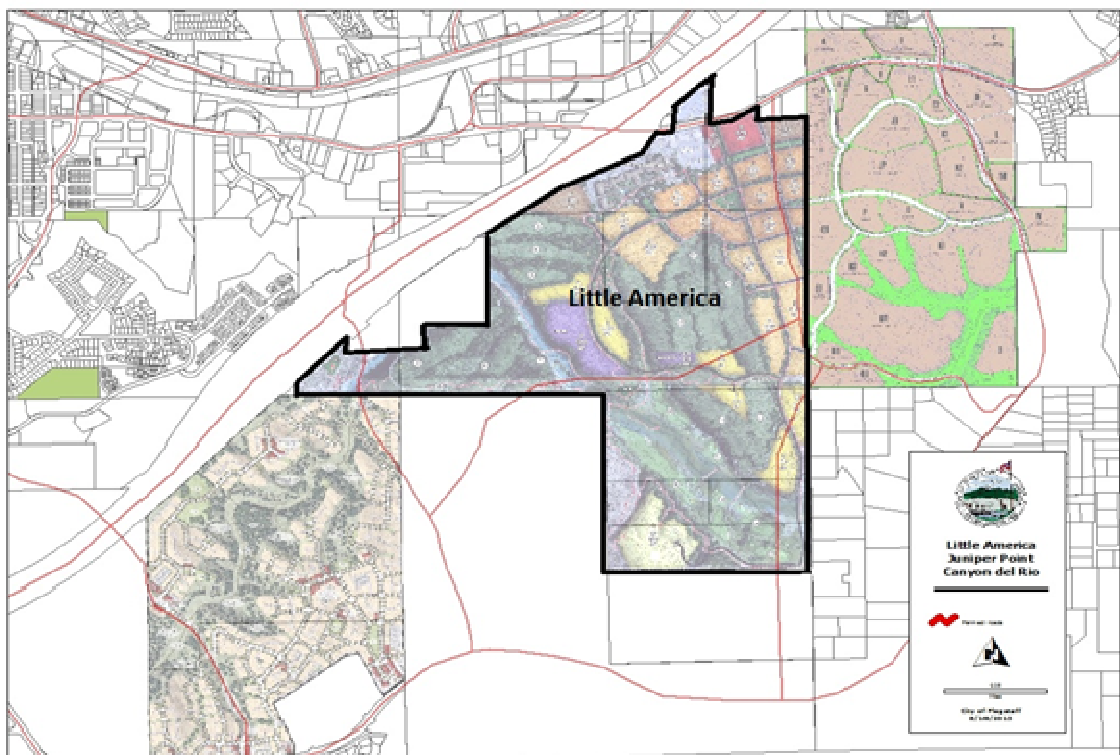


## I. INTRODUCTION

The Little America Development consists of approximately 537 acres of master planned mixed use community with hotel/meeting facilities, retail, residential neighborhoods and recreational amenities including golf. Plans for the site include the creation of 1415 single family dwelling units and approximately 47.8 acres dedicated to commercial use. The development will consist of the following Assessor Parcel Numbers (106-04-008, 106-04-005B, 106-09-001, 106-09-002, 106-10-001D, 106-10-001C, 106-10-001B, 106-10-002), which are located in portions of Section 23 & 26, T21N, R07E. The proposed development lies within the urban service boundary and has the ability to be served with City water and sewer utilities in accordance with the City of Flagstaff Engineering Standards.

The Little America Development preliminary plan layout and densities were provided by the developer and used as the basis for this preliminary analysis.

The City of Flagstaff Engineering Standards will be utilized to determine the flow characteristics for this project. This water and sewer impact study is considered valid for a period of one year from the completion date.



Vicinity Map  
N.T.S.

## II. ANALYSIS SUMMARY

### **On-site modifications:**

**Sewer:** Currently there is no infrastructure in the ground to support this development, so all systems will have to be designed and built.

**Water:** Currently there is no infrastructure in the ground to support this development, so all systems will have to be designed and built. The waterline from the Butler Avenue to the southern boundary of the Little America Development shall be a 12" diameter PVC pipe.

**Reclaimed Water:** Currently there is not infrastructure in the ground to support this development, so all systems will have to be designed and built. The reclaimed waterline in the Rio de Flag is a 12" diameter line.

### **Off-site modifications** indicated by the analysis are:

**Sewer:** Based upon the City of Flagstaff Sewer Interceptor model and the attached analysis, no offsite improvements to the offsite sewer collection system will be required.

**Water:** Based upon the City of Flagstaff water model created, off-site water improvements are required. Within John Wesley Powell the extension from the current waterline terminus to the access road intersection to John Wesley Powell shall be a 20" diameter Ductile Iron Watermain. The diameter of the waterline pipe from John Wesley Powell to the southern boundary of the Little America Development shall be a 12" diameter PVC watermain.

In addition the City requires that water production improvements be made by the developer in the form of wells and storage tanks.

**Reclaimed Water:** Based upon the City of Flagstaff Reclaimed Water Model no offsite improvements will be required. The City of Flagstaff cannot provide the required daily flows at this time.

## III. WATER SYSTEM ANALYSIS

### A. EXISTING WATER SYSTEM

The proposed development falls within City of Flagstaff pressure Zone B with elevation limits as high as 6882.

The nearest adequate source of Zone B water supply is in Butler Avenue along the north property line of this development. There is a 24" diameter ductile iron water main located in Butler Avenue. The nearest second source of water is a 20" ductile iron waterline that is at the end of the current John Wesley Powell Boulevard.



## B. PROPOSED WATERLINE EXTENSIONS

The developer has shown and will be required to provide a looped water system. The developer has provided the City of Flagstaff with a preliminary layout for the site. The water system shall consist of 12 inch diameter water mains from Butler, through the main roadway loop and to the south connecting to John Wesley Powell. It should be understood that all internal pipe configurations shall be looped as well as the source water lines. The internal loop modeled is a 12" PVC pipe. As the subdivision plat is defined internal distribution lines can be modeled.

The City of Flagstaff regional land use plan projects extensive growth in this area of the City. In addition, the Utility Department's long range plans call for the extension of the Zone B transmission lines in the extension of John Wesley Powell to consist of a 20" diameter main. Ultimately this waterline extension will extend to Fourth Street.

The water system analysis utilized two connections to the existing water system in this area. One connection will be made to the 24" watermain in Butler Avenue, and the second connection to the 20" watermain in John Wesley Powell.

### C. WATER SYSTEM DEMANDS

The following criterion was utilized in determining the anticipated water demands for the project.

Dwelling Units = 1415 Single Family Homes  
Persons per Dwelling Unit = 3.5 for single family  
Fire Flow = 1000 gpm single family residential  
Water Demand = 100 gal/capita/day (gpcd) average residential  
250 gcd peak residential  
Commercial = 47.8 acres  
Fire Flow = 1500 gpm commercial  
Water Demand = 2000 gal/acre/day (gpac) average commercial

Hotel = 200 rooms  
Persons per Room = 2  
Water Demand = 200 gal/capita/day (gpcd) average hotel

Average Demand:

1415 dwelling units x 3.5 people/unit x 100 gpcd = 495,250 gal/day  
47.8 acres x 2000 gpad = 95,600 gal/day  
200 rooms x 2 people/room x 200 gpcd = 30,000

Total Average Demand = 620,850 gpd

**Average Water Demand = 620,850 gal/day**

**Average Water Demand = 431.1 gal/min**

Peak Water Demand

1415 dwelling units x 3.5 people/unit x 250 gpcd = 1,238,125 gal/day

47.8 acres x 5000 gpad = 239,000 gal/day

200 rooms x 2 people/room x 75 gpd x 3 peak factor = 90,000 gal/day

Total Peak Water Demand = 1,567,125 gal/day

**Peak Water Demand = 1,567,125 gal/day**

**Peak Water Demand = 1088.3 gpm**

D. WATER SYSTEM ANALYSIS RESULTS

Results of the computer analysis revealed a range in **static pressure off-site** in the vicinity of the project of 55.3 psi @ J-9787 to 135.7 psi @ J-5643. These pressures are consistent given the elevations of the junction nodes within the analyzed boundary. The **static pressure within the project** ranges between 99.2 psi and 122.3 psi. The 99.2 psi reading occurs at an elevation of approximately 6880' at junction node J-14286. The lowest static pressure reading of 97.80 psi is above the City Engineering Standards minimum static pressure of 40 psi.

Based upon the computer model, fire flows and residual pressures will drop slightly in a portion of Zone B due to the withdrawal of fire flows for this project. The drop in pressure is located at high points in Zone B and in one area creates an unacceptable low pressure. This drop in pressure is a reflection of the high demand that this development will create on the overall system. It is anticipated that this high demand will be offset by the addition of the required tank and well. The area that will not retain adequate pressure is located in the downtown area at elevation 7100, and has been removed from the model due to the lack of adequate pressure. If that area is removed the findings of this report indicated that adequate pressure can be maintained the remainder of Zone B. The secondary area of low pressure is located in the northern part of Ponderosa Trails. With the improvements proposed by the developer, including additional productive wells and the proposed tank there should be no threat to the personal safety or Fire protection of the existing area.

In addition to the connections required for the development of the subdivision, the City of Flagstaff will require that multiple connections be made to the east to provide connectivity to the Canyon Del Rio Project. It is anticipated that 8" diameter pipes will be adequate for the connections to Canyon Del Rio. The City of Flagstaff may elect to increase the size of these connections in the future

The City of Flagstaff is requiring that this development design and construct a 20" diameter water line in the extension of John Wesley Powell. The length of this extension is approximately 5500 feet long. This 20" diameter transmission line is to be designed to service the ultimate density of the area, not just this project site. As the watermain is conveyed from John Wesley Powell in a north/south access road it will be required to be a 12" diameter PVC main. It is the developer's responsibility to design, acquire adequate right-of-way, and construct the waterline in accordance with all city, state and federal rules and regulations.

The size of this project creates water supply demands that the current City of Flagstaff infrastructure cannot meet. In an effort to meet the demands, the City of Flagstaff requires that the developer construct a well or multiple wells necessary to meet the developments average daily usage and dedicate the well(s) to the City of Flagstaff. The production of the single well or the combination of multiple wells must exceed 413 gallons per minute (gpm).

The city of Flagstaff (COF) requires that all wells dedicated to the City must meet existing COF well standards, ADWR Standards and current ADEQ water standards and the following criteria. Each well must produce a minimum of 200 gallons per minute (gpm) and will need to be furnished with a well house. It is the developer's responsibility to obtain the appropriate land and right-of-way required to place the well(s).

The developer must also construct a storage tank. The tank shall store a minimum of 800,850 gallons, and must be placed at an elevation that will provide adequate pressure for the Zone B system. It is the developer's responsibility to obtain the appropriate land and right-of-way required to place the tank(s) and convey the water from the tanks(s) to the public distribution system.

The developer shall construct the storage tank in accordance with all city, state and federal rules and regulations. This may entail purchasing land off-site at a high enough elevation to provide adequate pressure and easements for the associated transmission lines. The City may choose to participate with the developer providing funds to increase the size of the tank to 1,000,000 gallons.

The storage tank required above is subject to a fee equal to the estimated amount of operation and maintenance expenses for a period of twenty years. The developer's cost will be equal to their portion of the tank size. Such fee shall be agreed to by the city and Developer and paid prior to any occupancy being allowed in the development.

It should also be noted that Pressure Reducing Valves shall be installed on all water services located within this project because of the high range of static water pressures (99 thru 122 psi) on-site.

## IV. SEWER SYSTEM ANALYSIS

### A. EXISTING SEWER SYSTEM

The nearest sewer that allows for gravity flow from this site is located in the Rio de Flag Wash as shown the GIS Sewer Map (Figure 5). The existing sewer line is a 42" diameter (Reinforced Concrete Pipe with a PVC liner) interceptor line that gravity flows to the east along the alignment of the Rio De Flag.

The Wildcat Hill Wastewater Treatment Plant, which is currently operating below maximum capacity, will treat all sewage collected in this line. The Wildcat Hill facility currently processes 3.6 million gallons per day. This facility has a design capacity of 6 million gallons per day. The design flows from the Little America Development indicate an average daily flow increase to the plant of 456,738 gallons per day.

The current users of this sewer collector system consist of a large portion of the City of Flagstaff including the downtown area, NAU and a majority of the west side of the City of Flagstaff. This analysis takes into account the anticipated flows generated by proposed projects such as the McMillan Mesa Developments and the Juniper Point Subdivision.

### B. PROPOSED SEWER SYSTEM EXTENSIONS

The developer has not provided a layout for the sewer system within the proposed development. At this preliminary stage the anticipated peak sewage flows have been placed at the lowest manhole junction R-016. The sewer line within the Rio de Flag at this point consists of a 42" diameter PVC sewer interceptor line.

The on-site sewer system was not analyzed as a part of this report and shall be addressed in the Engineer's Design Report. This work shall be consistent with the requirements called out in the City of Flagstaff Engineering Standards.

It was assumed the sewage from this development contributes to the City of Flagstaff sewer collection system at the lowest point adjacent to the site to manhole R-016, which passes through this site in the southeast corner of the project

### C. SEWER SYSTEM FLOWRATES

The following criterion was utilized in determining the anticipated wastewater generation for the project and surrounding parcels.

Dwelling Units = 1415 Single Family Homes

Persons per Dwelling Unit = 3.5 for single family  
Loading Criteria = 75 gal/capita/day (gcd) residential  
Residential Peaking Factor = 1.96

Commercial Sewer Flows  
Area = 47.8 acres  
Average Loading Criteria = 1000 gal/acre/day (gpac) commercial  
Peak Loading Criteria = 3000 gal/acre/day (gpac) commercial peak

Hotel Sewer Flows  
Rooms = 200  
Persons per Room = 2  
Loading Criteria = 75 gpac  
Peaking Factor = 2.6

#### Average Sewer Flows

1415 homes x 3.5 people per home x 75 gpac = 371,437.5 gal/day  
47.8 acres x 1000 gpac = 47,800 gal/day  
200 Rooms x 75 gpac x 2.5 occupants per room = 37,500 gal/day

Total Average Sewer Flows = 456,737.5 gal/day

#### Peak Sewage Flows

Residential : 1.96 x 371,437.5 gal/day = 728,017.5 gal/day  
Commercial: 3000 gpac x 47.8 acres = 143,400 gal/day  
Hotel: 37,500 x 2.6 peaking factor = 97,500 gal/day

Total Peak Sewage Flows = 968,917.5 gal/day  
Total = 672.4 gal/minute  
= 1.498 cubic feet per second

#### D. SEWER SYSTEM ANALYSIS RESULTS

In the model prepared, all of the sewer flows for the site were contributed to manhole number R-016 located along the Rio de Flag wash. The capacity of the existing collection system downstream of this project is adequate to convey the existing and proposed flow rates and maintain the required less than 70% (d/D) pipe capacity. Some offsite sewerlines are indirectly affected by this development, but no improvements will be required.

City Engineering Standards state that when a sewer line extension is required, the impact study shall include not only this proposed development but also the anticipated growth into adjacent tracts. All proposed extensions within the project limits must be constructed to accommodate full build-out of the entire drainage

basin per City of Flagstaff Engineering Standards, Section 9-02-030. All off-site improvements or resizing addressed include this additional required capacity.

It is a requirement that every effort be made to locate all public sewer mains within the right-of-way/roadway (public or private) and secondly, within a dedicated public utility easement as necessary to serve this community. Accessibility for maintenance purposes is a high priority of the Utilities Department.

## V. RECLAIM WATER SYSTEM ANALYSIS

### A. EXISTING RECLAIM WATER SYSTEM ANALYSIS

There is one existing reclaimed water line that is located in the vicinity of this development. Currently a twelve inch (12") reclaimed water main is located in the Rio de Flag drainage channel. This is the nearest reclaimed water source connection point that could be used for this project. The 12" reclaimed main is a one-way feed and runs through the middle of the proposed development.

### B. PROPOSED RECLAIMED WATER SYSTEM EXTENSION

The developer has not provided a layout for the reclaimed water system within the proposed development. At this preliminary stage the anticipated peak reclaimed water flows have been placed at the lowest junction within the development. The reclaimed water line within the Rio de Flag at this point consists of a 12" diameter PVC line.

The on-site reclaimed water system was not analyzed as a part of this report and shall be addressed in the Engineer's Design Report. This work shall be consistent with the requirements called out in the City of Flagstaff Engineering Standards.

### C. RECLAIMED WATER SYSTEM DEMANDS

The following is the criteria that was utilized in determining the node demands that will be placed on the COF system by the Little America Development

<u>Site Location</u>	<u>Average Demand</u>	<u>Peak Demand</u>
18 Hole Golf Course	784 gpm	1980 gpm

It is anticipated that the golf course will be watering during off-peak irrigation times, which is normally from 12 am to 6 am due to course usage, drying times, evaporation, etc. For the purposes of this study we used water demands

provided by Design Workshop in Denver Colorado, using 1,128,960 gallons per day.

Other users in the area could include regional parks, schools and public landscape areas, which have not been identified at this point. These additional loads could be fed from a main extension to their areas and given flowrates within reason, would not impact the system hydraulically.

#### D. RECLAIMED WATER SYSTEM ANALYSIS RESULTS

The golf course within this project creates reclaimed water demands that the current City of Flagstaff infrastructure cannot provide. At the current time the City has only 390 GPM available in reclaimed water resources to commit to this project. In order to meet the additional reclaimed water demands the existing wastewater treatment plants require more incoming influent flows. The available supply of reclaimed water will increase in the future as additional development and subsequent sewer flows occur. In an effort to meet the demands, the developer may install their own raw water wells or choose to wait until additional reclaimed water resources are available from the City of Flagstaff.

The results of the hydraulic analysis show that the 12" main would meet the peak demand flows that would be required. No regional parks were included in this analysis. Demand flows were contributed at J-118 and the resulting residual pressure at that junction was calculated at 81 psi.

The developer shall construct reclaimed waterlines within their development to all major reclaimed users, such as parks, schools and public streetscapes. The developer is required to install and test the new reclaim water line as part of their development agreement.

## VI. CONCLUSIONS

Off-site water infrastructure improvements are required to provide adequate water service to the site, the existing sewer infrastructure offsite is impacted by this development, but appears to be adequate by the City. The City of Flagstaff will provide water and sewer service to this site upon acceptance and dedication of all required public improvements. The findings of this analysis indicate that the completion of the project can comply with the public water and sewer infrastructure requirements as outlined in the current City of Flagstaff Engineering Standards if the outlined improvements are done. Deviations from the intent shown on the Tentative Plat and preliminary drawings provided, and/or further development above that shown on the preliminary drawings provided will require additional review and must gain full Development Review Board approval.



The size of this project creates water supply demands that the current City of Flagstaff infrastructure cannot provide. In an effort to meet the demands, the City of Flagstaff requires that the developer construct a well or multiple wells necessary to meet the developments average daily usage and dedicate the wells (s) to the City of flagstaff. The production of the well(s) must exceed 413 gallons per minute (gpm). It is the developer's responsibility to obtain the appropriate land and right-of way required to place the well(s) and convey the water to the public distribution system.

The developer must also construct a storage tank. The tanks shall store a minimum of 800,850 gallons, and must be placed at an elevation that will provide adequate pressure for the Zone B system. It is the developer's responsibility to obtain the appropriate land and right-of-way required to place the tanks(s) and convey the water from the tanks(s) to the public distribution system.

Significant off-site infrastructure improvements to water wells, storage tanks, reclaimed water and sewer lines as detailed above are required of this development. The City of Flagstaff will provide water and sewer service to this site upon acceptance and dedication of all required public improvements. The findings of this analysis indicate that the completion of the Little America Development Project can comply with the public water and sewer infrastructure requirements as outlined in the current City of Flagstaff Engineering Standards after the off-site improvements are made.

The on-site construction plans and off-site improvements may be phased as detailed below.

1. The city may issue building permits for up to 228 residential units (Development Phase 1), before any off-site improvements are required.
2. Before any more building permits are issued, the developer shall have installed the required wells, pump houses/s, storage tank capacity, watermain in John Wesley Powell and reclaimed water lines.
3. After the above improvements are in place and accepted, the developer may complete the remaining phases of the development.

The size of this project is smaller in area than the total area to be serviced by the proposed water and sewer mains. The City of Flagstaff is requiring that the water and sewer mains be designed, sized and constructed to accommodate the future build out of this area. In order to accommodate future growth, the waterline extension along John Wesley Powell shall be a 20" diameter ductile iron line water line. City participation in utility extensions is detailed in chapter 9-04 of the City of Flagstaff Engineering Design and Construction Standards and Specifications. City participation is subject to available funding in future fiscal year budgets.

This report addresses the generalized master plan, at future tentative plat submittal phases additional water and sewer impact studies may be required. The Utilities Department will require specific analysis of proposed waterline phasing as the development is designed.

The exact location of any required fire hydrants related to this project is left to the discretion of the City of Flagstaff Fire Department in accordance with City of Flagstaff Engineering Standards and current Fire Codes. Approval by the City Engineer shall also be obtained. Water pressures and require fire flows of 1500 gpm will not be an issue within the limits of this development.

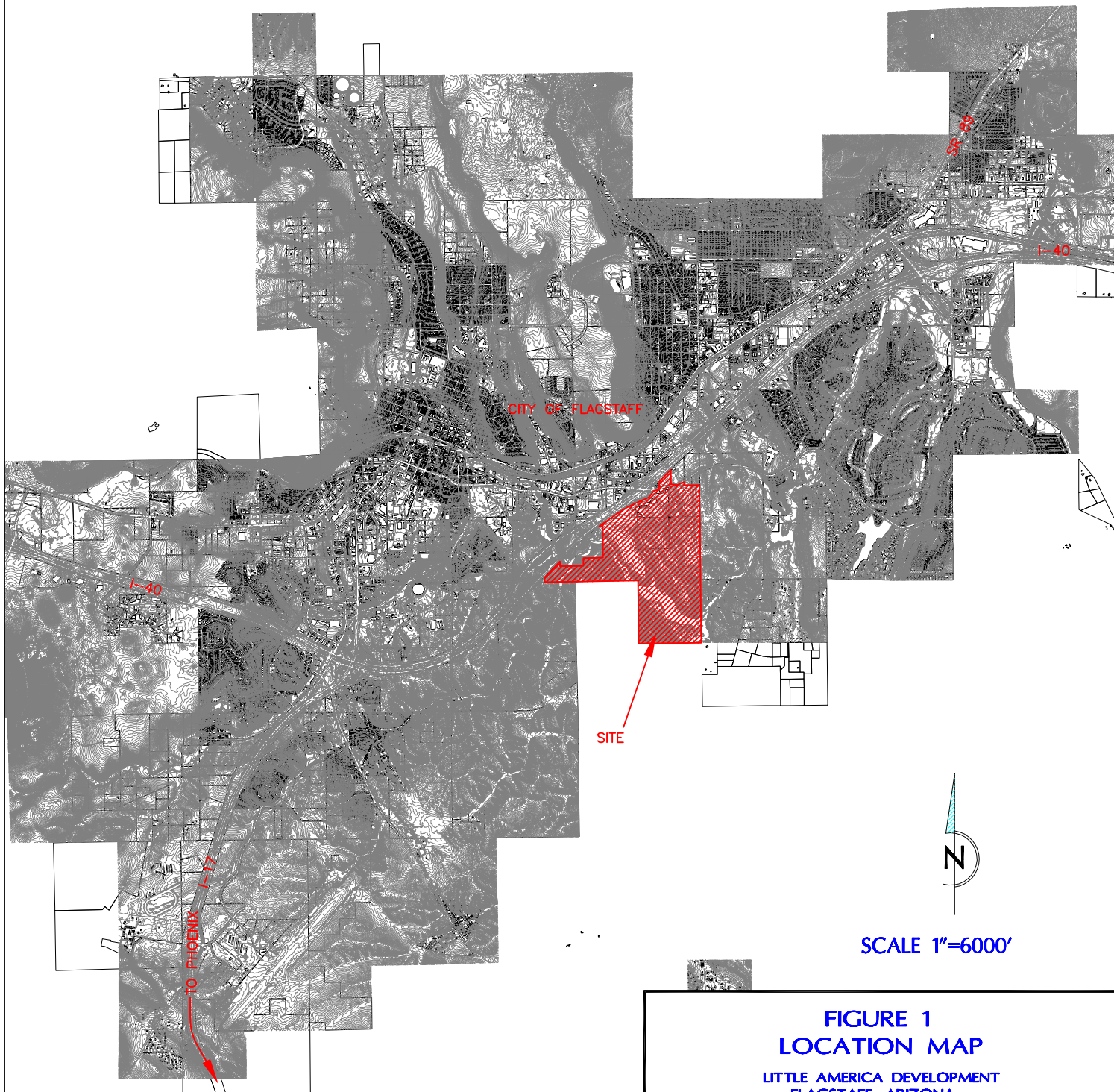
Water and Sewer analysis was done with Bentley Systems software, formerly known as Haestad Methods software. The existing City of Flagstaff master water and sewer models were modified.

All existing utility information is based upon City of Flagstaff GIS data and the best available data. Field survey work should be done to confirm pipe sizes, materials and location prior to design and construction.

This water and sewer impact study is considered valid for a period of one year from the completion date of September 17, 2013. All utility line and treatment plant capacity reservations as a result of this study will expire at that time.

Attachments:

- Location Map
- City of Flagstaff Watercad Map
- Bentley Systems SewerCad Drawing
- City of Flagstaff GIS Water Map
- City of Flagstaff GIS Sewer Map
- Reclaimed Water System Exhibit
- Subdivision Exhibit
- Future Development South of I-40
- Water System Fire Flow Analysis Report
- Water System Junction Report
- SewerCad Gravity Pipe Report
- Reclaimed Water System Analysis

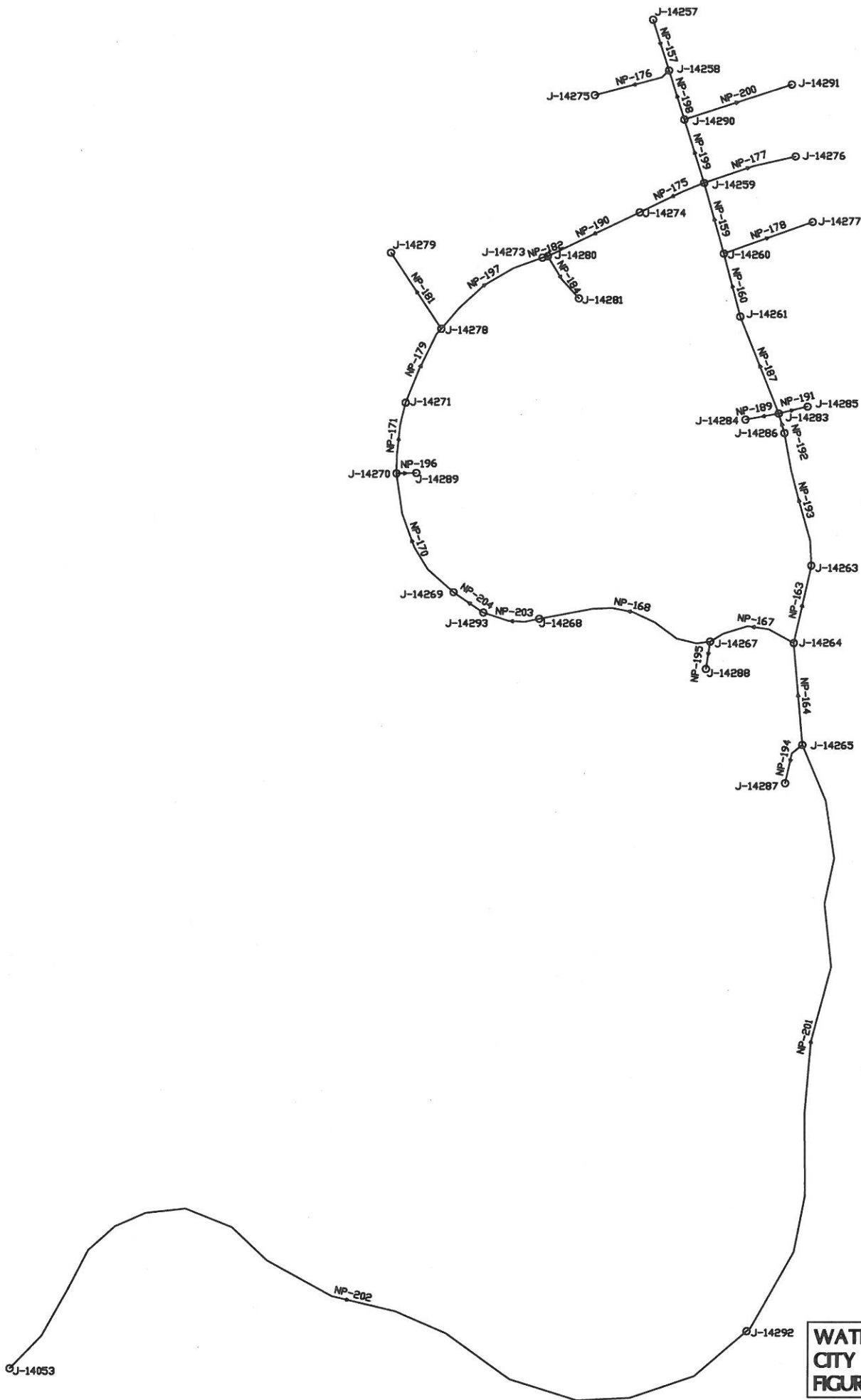


**FIGURE 1  
LOCATION MAP**

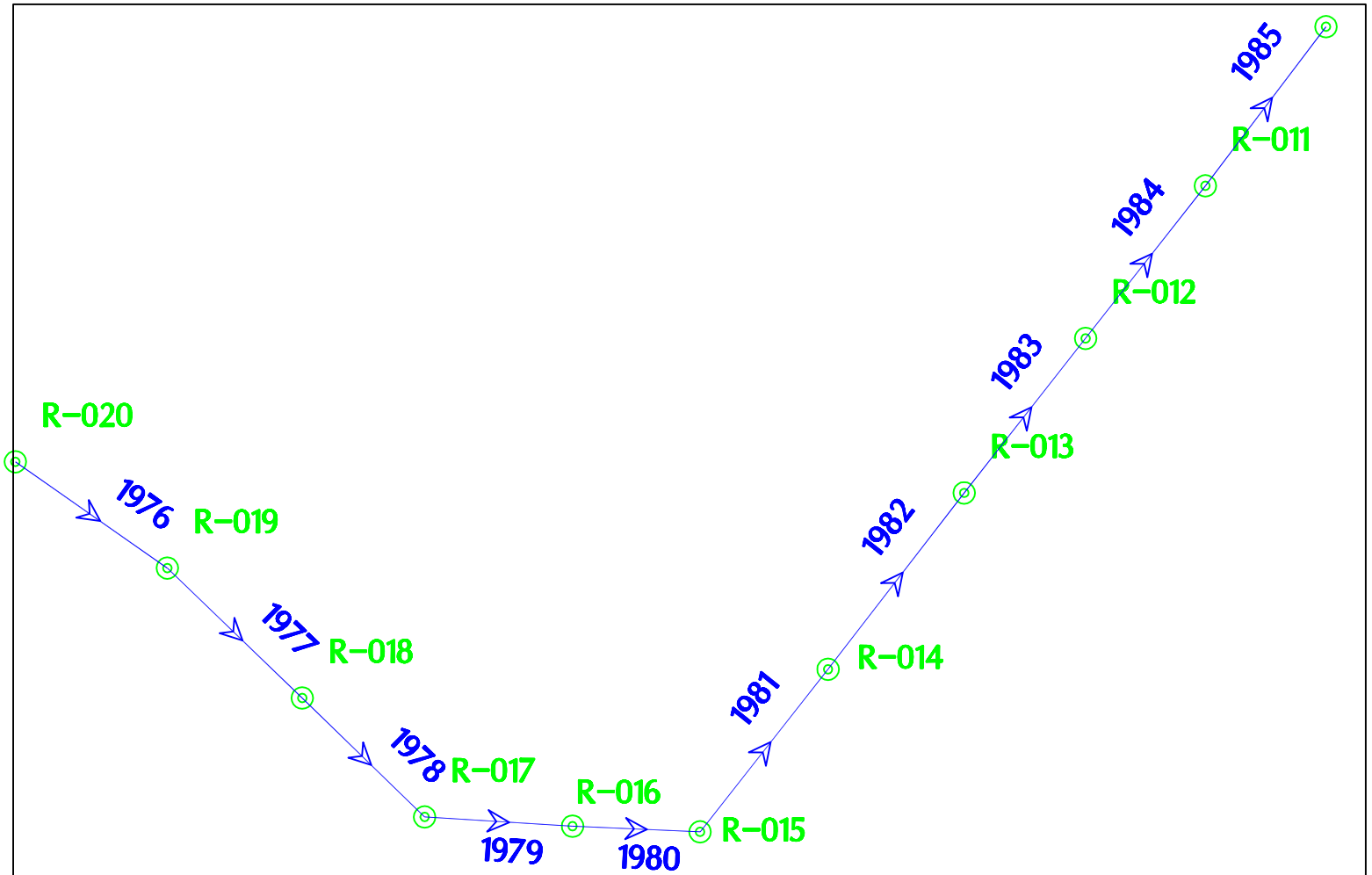
**LITTLE AMERICA DEVELOPMENT  
FLAGSTAFF, ARIZONA**

**CIVIL DESIGN & ENGINEERING, INC.  
P.O. BOX 30836  
FLAGSTAFF, ARIZONA 86003-0836  
PHONE (928) 522-9287**

**FIGURE 1**



**WATERCAD MAP  
CITY OF FLAGSTAFF  
FIGURE 2**



Little America All Flows R-016



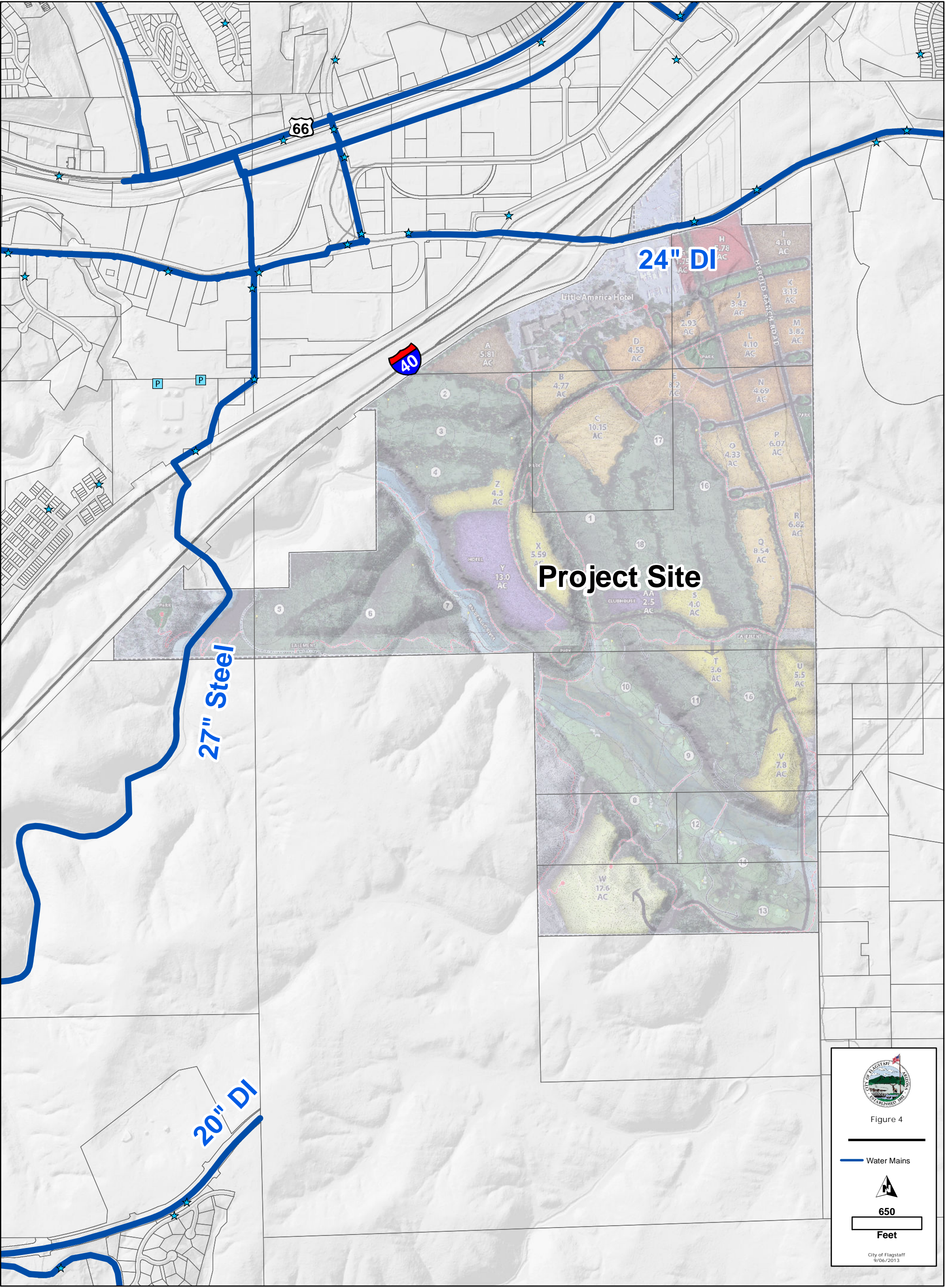
NOT TO SCALE

FIGURE 3  
BENTLEY SEWERCAD DRAWING  
LITTLE AMERICA DEVELOPMENT

CIVIL DESIGN & ENGINEERING, INC.  
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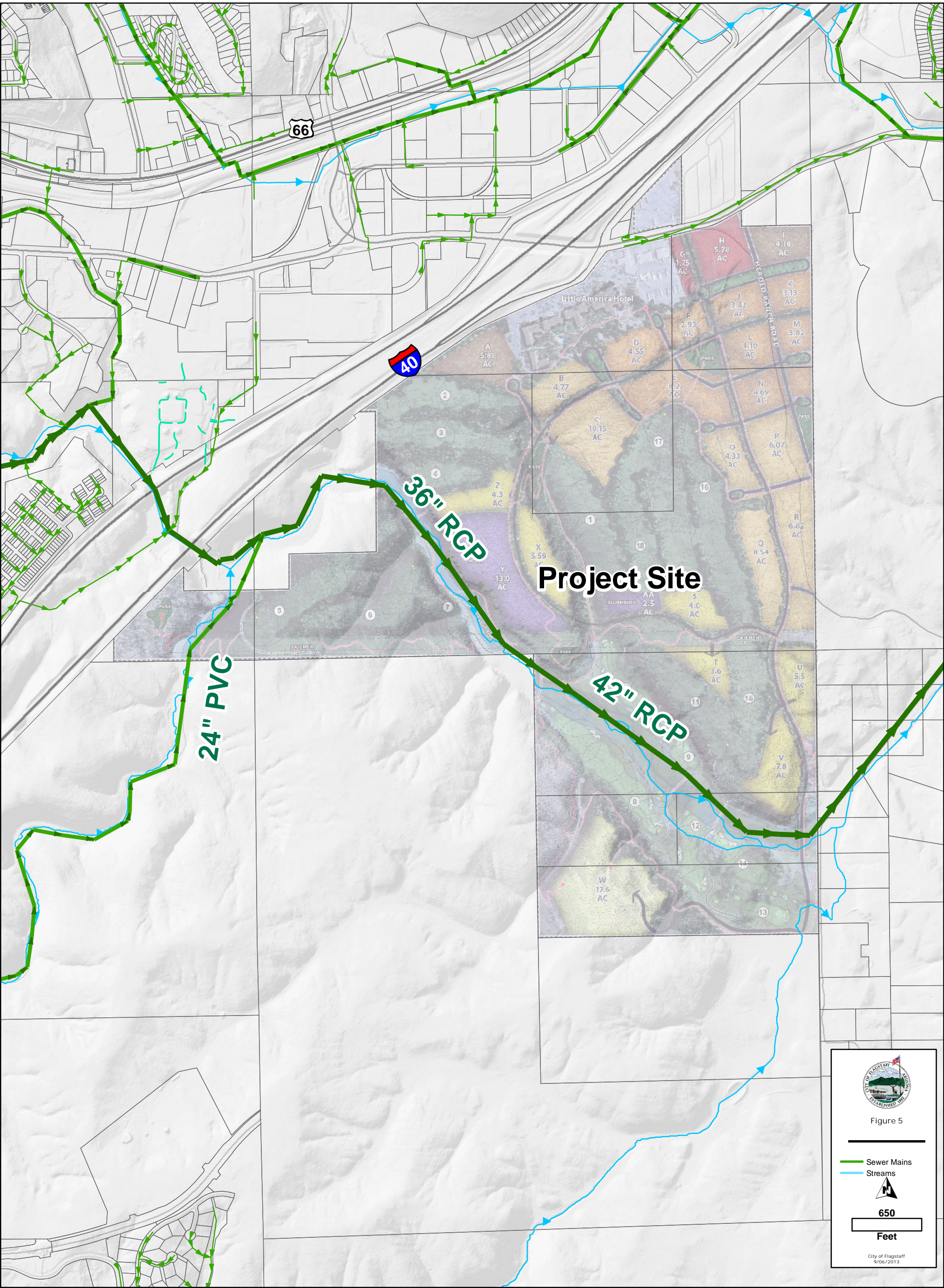
--- Utilities GIS Water Map ---



--- Utilities GIS Water Map Fig. 4 ---

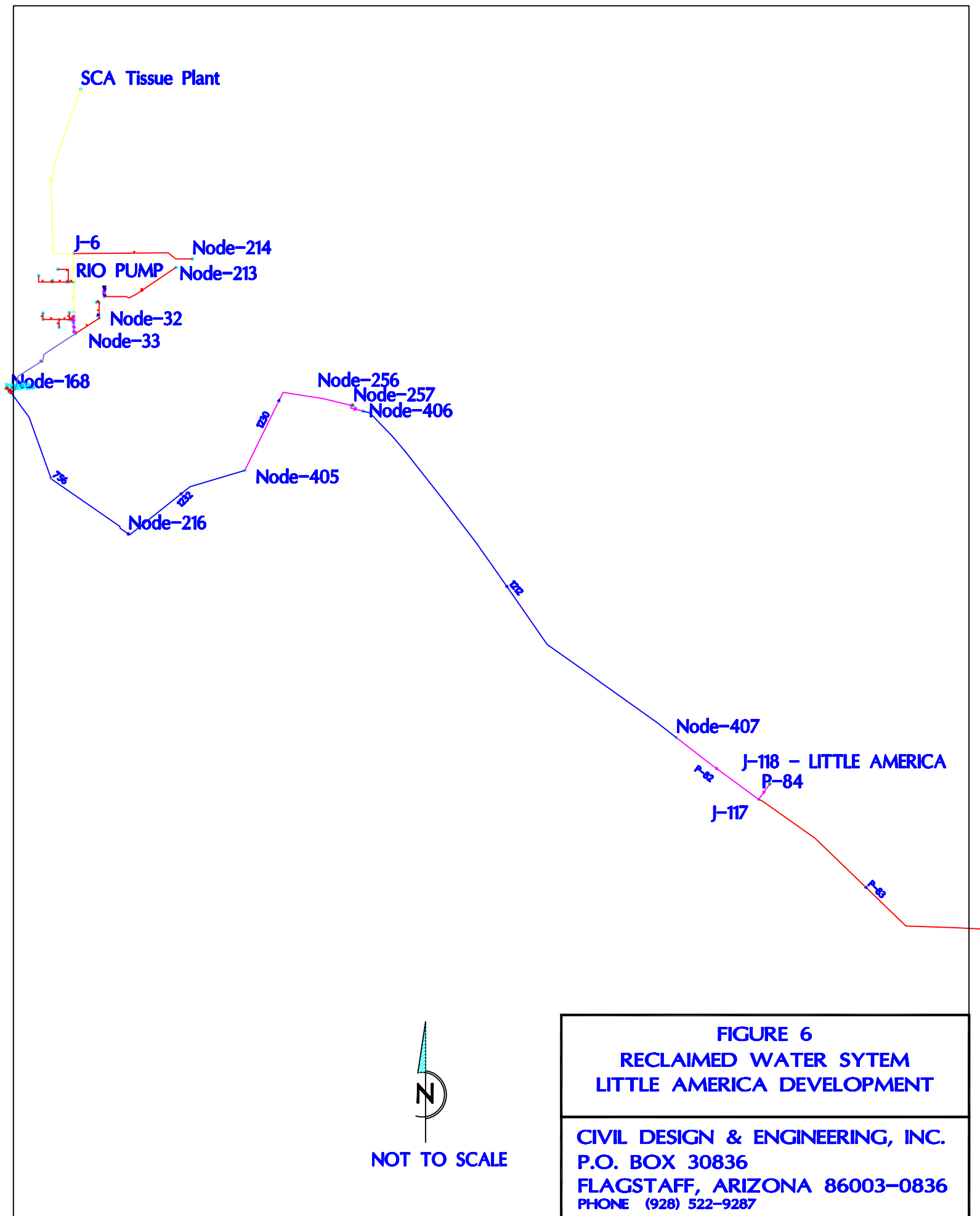


--- Utilities GIS Sewer Map ---

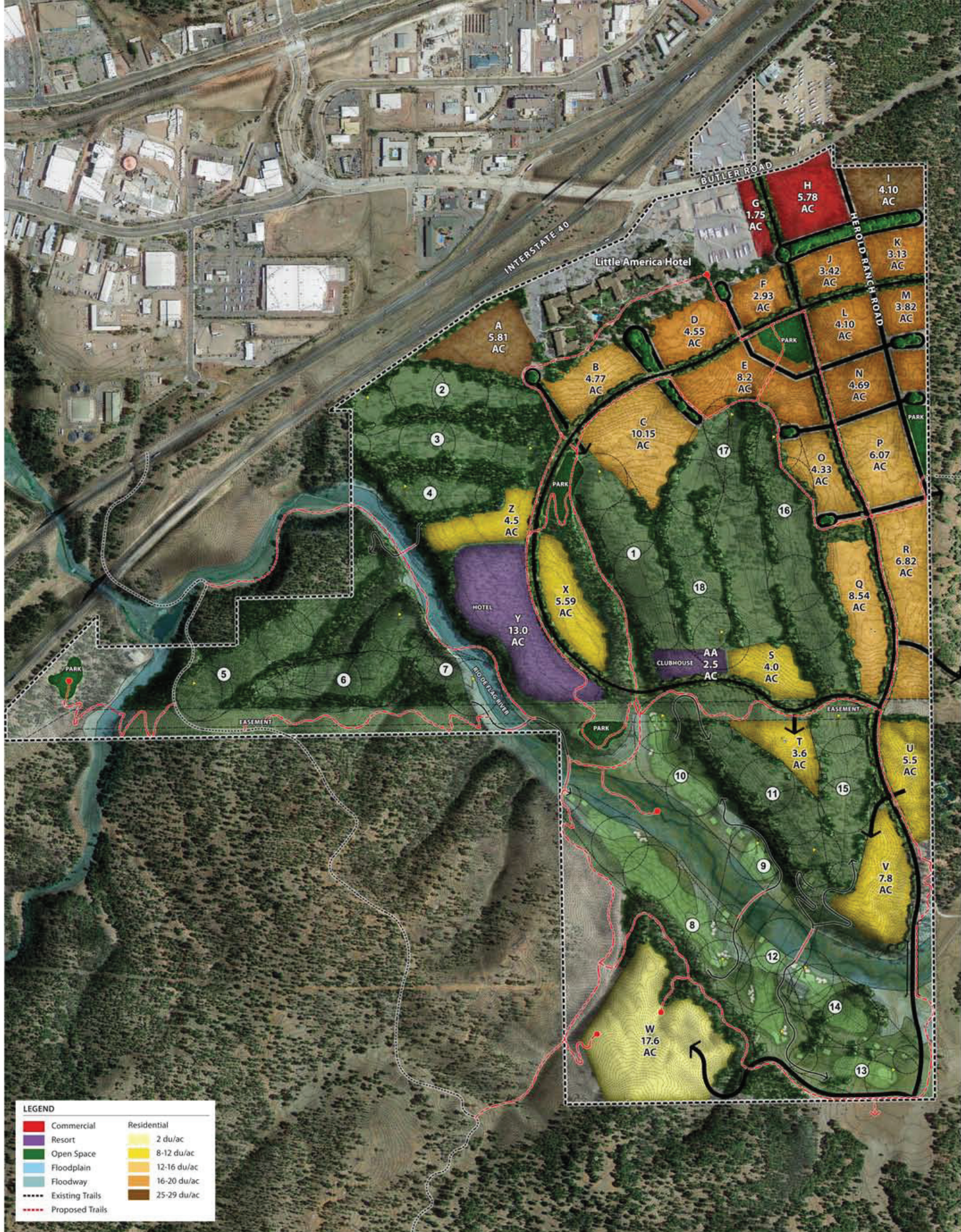


--- Figure 5 ---

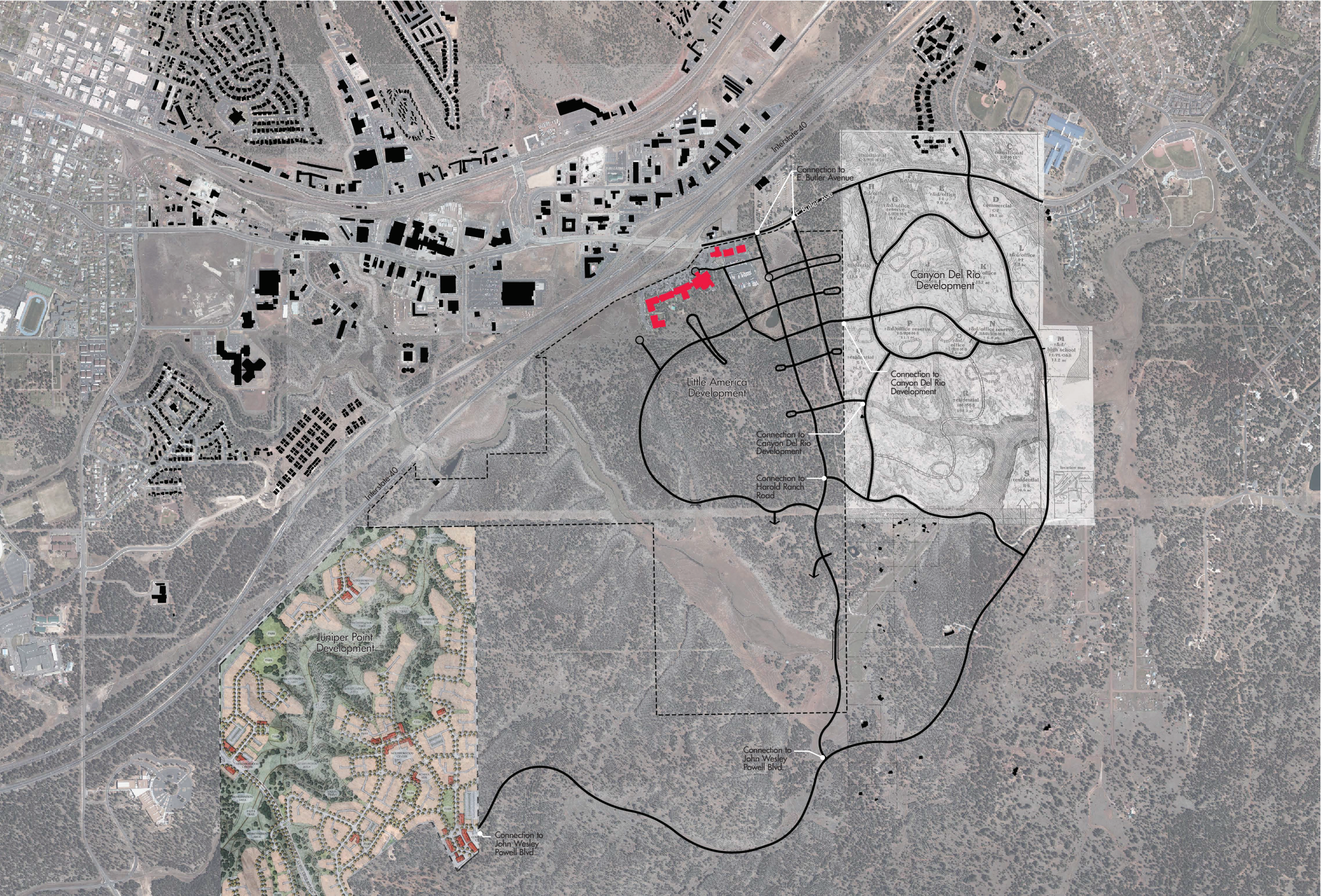






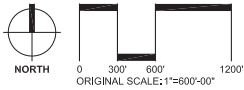






**CIRCULATION PLAN (2.1.12)**

The road network within the Little America Neighborhood has been designed to provide connectivity to the areas within the property boundary as well as to existing and proposed developments outside the boundary. The roads connect to E. Butler Ave., to the north as well as to the proposed roads within the Canyon del Rio property to the east. Discussions regarding the extension of John Wesley Powell Boulevard are underway and the potential connection to the extension to Fourth Street has been included.



- LEGEND**
- Proposed Road
  - Proposed Road (If Required)
  - Proposed Bridge (If Required)

Figure 8



## FIRE FLOW REPORT

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Flow (Total Available) (gpm)	Pressure (Calculated Residual) (psi)	Junction w/ Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
192208	B	TRUE	1,500.00	2,433.41	2,433.41	88.5	J-14189	TRUE
192209	B	TRUE	1,500.00	2,430.68	2,430.68	84.1	J-14189	TRUE
192214	B	TRUE	1,500.00	2,431.27	2,431.27	77.9	J-14189	TRUE
192216	B	TRUE	1,500.00	2,434.04	2,434.04	92.1	J-14189	TRUE
192217	B	TRUE	1,500.00	2,440.29	2,440.29	94.7	J-14189	TRUE
192218	B	TRUE	1,500.00	2,442.58	2,442.58	97.4	J-14189	TRUE
192219	B	TRUE	1,500.00	2,443.04	2,443.04	97.5	J-14189	TRUE
192301	B	TRUE	1,500.00	2,445.53	2,445.53	102.2	J-14189	TRUE
192302	B	TRUE	1,500.00	2,451.81	2,451.81	113	J-14189	TRUE
192303	B	TRUE	1,500.00	2,457.13	2,457.13	115.3	J-14189	TRUE
192304	B	TRUE	1,500.00	2,456.07	2,456.07	115.2	J-14189	TRUE
192305	B	TRUE	1,500.00	2,462.86	2,462.86	108.1	J-14189	TRUE
192306	B	TRUE	1,500.00	2,466.13	2,466.13	116.7	J-14189	TRUE
192309	B	TRUE	1,500.00	2,461.53	2,461.53	93	J-14189	TRUE
192310	B	TRUE	1,500.00	2,462.24	2,462.24	89.3	J-14189	TRUE
192311	B	TRUE	1,500.00	2,460.12	2,460.12	82.5	J-14189	TRUE
192312	B	TRUE	1,500.00	2,465.15	2,465.15	91.4	J-14189	TRUE
222001	B	TRUE	1,500.00	1,936.58	1,936.58	55.7	J-14189	TRUE
222002	B	TRUE	1,500.00	1,936.49	1,936.49	40.4	J-14189	FALSE
222003	B	TRUE	1,500.00	1,937.75	1,937.75	43.2	J-14189	TRUE
222004	B	TRUE	1,500.00	1,940.31	1,940.31	41.8	J-14189	TRUE
232002	B	TRUE	1,500.00	1,933.58	1,933.58	72.6	J-14189	FALSE
232003	B	TRUE	1,500.00	1,933.51	1,933.51	79	J-14189	TRUE
232004	B	TRUE	1,500.00	1,939.66	1,939.66	79.6	J-14189	TRUE
232005	B	TRUE	1,500.00	1,936.33	1,936.33	65.3	J-14189	FALSE
232006	B	TRUE	1,500.00	1,938.75	1,938.75	60.8	J-14189	FALSE
232007	B	TRUE	1,500.00	1,939.88	1,939.88	50.4	J-14189	TRUE
232011	B	TRUE	1,500.00	1,938.17	1,938.17	59.7	J-14189	FALSE
232012	B	TRUE	1,500.00	1,937.06	1,937.06	61.9	J-14189	FALSE
232013	B	TRUE	1,500.00	1,940.01	1,940.01	56.6	J-14189	TRUE
232018	B	TRUE	1,500.00	1,934.45	1,934.45	57.5	J-14189	TRUE
J-10332	B	TRUE	1,500.00	1,873.83	1,873.83	20	J-14189	TRUE
J-10349	B	TRUE	1,500.00	2,440.65	2,440.65	98.6	J-14189	TRUE
J-10364	B	TRUE	1,500.00	1,936.90	1,936.90	70.7	J-14189	FALSE
J-10369	B	TRUE	1,500.00	2,464.06	2,464.06	113.6	J-14189	TRUE
J-10544	B	TRUE	1,500.00	2,460.56	2,460.56	30.6	J-14189	TRUE
J-10597	B	TRUE	1,500.00	1,939.88	1,939.88	60.1	J-14189	TRUE
J-10761	B	TRUE	1,500.00	1,939.01	1,939.01	65.8	J-14189	TRUE
J-11104	B	TRUE	1,500.00	1,933.44	1,933.44	76.3	J-14189	TRUE
J-11305	B	TRUE	1,500.00	1,944.18	1,944.18	47.5	J-14189	TRUE
J-11437	B	TRUE	1,500.00	2,459.62	2,459.62	119.9	J-14189	TRUE
J-11445	B	TRUE	1,500.00	1,933.63	1,933.63	65.8	J-14189	FALSE

## FIRE FLOW REPORT

J-11555	B	TRUE	1,500.00	1,938.86	1,938.86	72.5	J-14189	TRUE
J-11624	B	TRUE	1,500.00	2,429.54	2,429.54	95.6	J-14189	TRUE
J-11687	B	TRUE	1,500.00	1,936.38	1,936.38	70.9	J-14189	FALSE
J-11688	B	TRUE	1,500.00	2,128.00	2,128.00	20	J-14189	TRUE
J-11752	B	TRUE	1,500.00	1,934.04	1,934.04	82.7	J-14189	FALSE
J-11820	B	TRUE	1,500.00	1,940.51	1,940.51	48.2	J-14189	TRUE
J-11876	B	TRUE	1,500.00	2,451.01	2,451.01	115.4	J-14189	TRUE
J-12012	B	TRUE	1,500.00	2,459.64	2,459.64	104.8	J-14189	TRUE
J-12030	B	TRUE	1,500.00	2,201.72	2,205.61	20	J-14189	TRUE
J-12032	B	TRUE	1,500.00	1,942.20	1,942.20	46.6	J-14189	TRUE
J-12033	B	TRUE	1,500.00	1,943.88	1,943.88	44.1	J-14189	TRUE
J-12166	B	TRUE	1,500.00	2,431.79	2,431.79	96.9	J-14189	TRUE
J-12218	B	TRUE	1,500.00	1,933.92	1,933.92	62.1	J-14189	TRUE
J-12219	B	TRUE	1,500.00	1,939.99	1,939.99	61.6	J-14189	TRUE
J-12222	B	TRUE	1,500.00	2,431.05	2,431.05	91.4	J-14189	TRUE
J-12341	B	TRUE	1,500.00	2,453.69	2,453.69	116.1	J-14189	TRUE
J-12372	B	TRUE	1,500.00	2,455.01	2,455.01	119.3	J-14189	TRUE
J-12491	B	TRUE	1,500.00	1,933.54	1,933.54	84.7	J-14189	TRUE
J-12492	B	TRUE	1,500.00	1,936.07	1,936.07	83.6	J-14189	FALSE
J-12584	B	TRUE	1,500.00	1,934.01	1,934.01	67.1	J-14189	TRUE
J-12594	B	TRUE	1,500.00	2,455.42	2,455.42	119.4	J-14189	TRUE
J-12618	B	TRUE	1,500.00	2,441.43	2,441.43	103	J-14189	TRUE
J-12636	B	TRUE	1,500.00	1,937.98	1,937.98	43.7	J-14189	TRUE
J-12645	B	TRUE	1,500.00	1,939.77	1,939.77	58.8	J-14189	TRUE
J-12646	B	TRUE	1,500.00	1,940.32	1,940.32	49.5	J-14189	TRUE
J-12855	B	TRUE	1,500.00	2,435.90	2,435.90	95.4	J-14189	TRUE
J-12912	B	TRUE	1,500.00	1,939.58	1,939.58	84.7	J-14189	TRUE
J-13045	B	TRUE	1,500.00	1,939.54	1,939.54	81	J-14189	TRUE
J-1308	B	TRUE	1,500.00	1,939.46	1,939.46	64.7	J-14189	TRUE
J-1309	B	TRUE	1,500.00	1,940.06	1,940.06	63.7	J-14189	TRUE
J-13297	B	TRUE	1,500.00	1,933.99	1,933.99	66.8	J-14189	FALSE
J-14053	B	TRUE	1,500.00	1,939.40	1,939.40	45.5	J-14189	TRUE
J-14104	B	TRUE	1,500.00	2,428.33	2,428.33	95	J-14189	TRUE
J-14257	B	TRUE	1,500.00	2,430.52	2,446.32	94.4	J-14189	TRUE
J-14258	B	TRUE	1,500.00	2,420.59	2,440.69	100.6	J-14189	TRUE
J-14259	B	TRUE	1,500.00	2,395.89	2,433.49	104.1	J-14189	TRUE
J-14260	B	TRUE	1,500.00	2,384.85	2,424.95	100.9	J-14189	TRUE
J-14261	B	TRUE	1,500.00	2,379.08	2,419.18	87.6	J-14189	TRUE
J-14263	B	TRUE	1,500.00	2,358.78	2,358.78	82.9	J-14189	TRUE
J-14264	B	TRUE	1,500.00	2,355.72	2,405.52	94	J-14189	TRUE
J-14265	B	TRUE	1,500.00	2,323.36	2,336.76	100.8	J-14189	TRUE
J-14267	B	TRUE	1,500.00	2,364.00	2,373.70	86.6	J-14189	TRUE
J-14268	B	TRUE	1,500.00	2,367.18	2,375.88	100.4	J-14189	TRUE
J-14269	B	TRUE	1,500.00	2,363.96	2,379.76	93.9	J-14189	TRUE
J-14270	B	TRUE	1,500.00	2,369.90	2,466.00	93.5	J-14189	TRUE
J-14271	B	TRUE	1,500.00	2,373.96	2,465.06	94.4	J-14189	TRUE
J-14273	B	TRUE	1,500.00	2,380.31	2,466.51	97.2	J-14189	TRUE

## FIRE FLOW REPORT

J-14274	B	TRUE	1,500.00	2,383.26	2,415.46	103.8	J-14189	TRUE
J-14275	B	FALSE	1,500.00	1,491.94	1,521.94	93.9	J-14189	FALSE
J-14276	B	TRUE	1,500.00	2,392.49	2,413.79	70.4	J-14189	TRUE
J-14277	B	TRUE	1,500.00	2,382.40	2,412.20	70	J-14189	TRUE
J-14278	B	TRUE	1,500.00	2,371.63	2,412.33	104.2	J-14189	TRUE
J-14279	B	TRUE	1,500.00	2,376.51	2,446.91	73.3	J-14189	TRUE
J-14280	B	TRUE	1,500.00	2,381.05	2,425.35	96.4	J-14189	TRUE
J-14281	B	TRUE	1,500.00	2,381.58	2,440.48	93	J-14189	TRUE
J-14283	B	TRUE	1,500.00	2,373.07	2,373.07	80.5	J-14189	TRUE
J-14284	B	TRUE	1,500.00	2,374.64	2,398.94	77.6	J-14189	TRUE
J-14285	B	TRUE	1,500.00	2,374.40	2,418.70	76.5	J-14189	TRUE
J-14286	B	TRUE	1,500.00	2,367.82	2,423.12	81.4	J-14189	TRUE
J-14287	B	TRUE	1,500.00	2,329.10	2,347.90	85.9	J-14189	TRUE
J-14288	B	TRUE	1,500.00	2,364.16	2,372.66	78	J-14189	TRUE
J-14289	B	TRUE	1,500.00	2,366.37	2,393.67	93.2	J-14189	TRUE
J-14290	B	TRUE	1,500.00	2,409.87	2,409.87	96.7	J-14189	TRUE
J-14291	B	TRUE	1,500.00	2,408.61	2,458.41	70.2	J-14189	TRUE
J-14292	B	TRUE	1,500.00	3,500.00	3,500.00	73.6	J-14189	TRUE
J-14293	B	TRUE	1,500.00	2,368.70	2,376.00	96.4	J-14189	TRUE
J-1533	B	TRUE	1,500.00	2,434.12	2,434.12	83.9	J-14189	TRUE
J-1534	B	TRUE	1,500.00	2,431.67	2,431.67	82.1	J-14189	TRUE
J-2072	B	TRUE	1,500.00	2,447.58	2,447.58	109.2	J-14189	TRUE
J-2073	B	TRUE	1,500.00	2,446.08	2,450.75	107.4	J-14189	TRUE
J-2089	B	TRUE	1,500.00	1,937.07	1,937.07	64.7	J-14189	FALSE
J-2090	B	TRUE	1,500.00	1,934.17	1,934.17	63.7	J-14189	FALSE
J-2319	B	TRUE	1,500.00	2,450.51	2,450.51	109.5	J-14189	TRUE
J-2366	B	TRUE	1,500.00	1,937.74	1,937.74	64.8	J-14189	FALSE
J-2367	B	TRUE	1,500.00	1,940.05	1,940.05	63.7	J-14189	TRUE
J-2511	B	TRUE	1,500.00	1,934.24	1,934.24	60.8	J-14189	FALSE
J-2512	B	TRUE	1,500.00	1,934.41	1,934.41	60.9	J-14189	TRUE
J-2690	B	TRUE	1,500.00	1,934.09	1,934.09	65.4	J-14189	FALSE
J-2691	B	TRUE	1,500.00	1,934.49	1,934.51	65.4	J-14189	FALSE
J-3040	B	TRUE	1,500.00	1,939.86	1,939.86	64.9	J-14189	TRUE
J-3121	B	TRUE	1,500.00	2,431.86	2,431.86	83.2	J-14189	TRUE
J-3122	B	TRUE	1,500.00	2,434.03	2,434.03	82.7	J-14189	TRUE
J-3312	B	TRUE	1,500.00	1,938.27	1,938.27	60.8	J-14189	FALSE
J-3313	B	TRUE	1,500.00	1,939.84	1,939.84	60.8	J-14189	TRUE
J-3683	B	TRUE	1,500.00	1,934.65	1,934.65	67.7	J-14189	FALSE
J-3684	B	TRUE	1,500.00	1,939.51	1,939.51	67.3	J-14189	TRUE
J-3693	B	TRUE	1,500.00	1,934.06	1,934.06	65.5	J-14189	FALSE
J-4073	B	TRUE	1,500.00	2,465.01	2,465.01	95.6	J-14189	TRUE
J-4074	B	TRUE	1,500.00	2,465.01	2,465.01	95.9	J-14189	TRUE
J-4252	B	TRUE	1,500.00	1,933.33	1,933.33	83.5	J-14189	TRUE
J-4253	B	TRUE	1,500.00	1,939.26	1,939.26	83.6	J-14189	TRUE
J-4448	B	TRUE	1,500.00	1,935.25	1,935.25	62.5	J-14189	FALSE
J-4449	B	TRUE	1,500.00	1,933.85	1,933.85	62.1	J-14189	FALSE
J-4557	B	TRUE	1,500.00	2,454.18	2,454.18	118.3	J-14189	TRUE

## FIRE FLOW REPORT

J-4622	B	TRUE	1,500.00	2,432.45	2,432.45	86.7	J-14189	TRUE
J-4623	B	TRUE	1,500.00	2,428.34	2,428.34	86.1	J-14189	TRUE
J-4706	B	TRUE	1,500.00	2,433.96	2,433.96	79	J-14189	TRUE
J-4740	B	FALSE	1,500.00	871.89	871.89	20	J-14219	TRUE
J-4865	B	TRUE	1,500.00	2,428.41	2,428.41	96.6	J-14189	TRUE
J-4866	B	TRUE	1,500.00	2,429.67	2,429.67	95.7	J-14189	TRUE
J-4921	B	TRUE	1,500.00	2,458.49	2,458.49	120.1	J-14189	TRUE
J-4922	B	TRUE	1,500.00	2,462.03	2,462.03	120.1	J-14189	TRUE
J-5281	B	TRUE	1,500.00	2,430.71	2,430.71	94.9	J-14189	TRUE
J-5304	B	TRUE	1,500.00	2,469.66	2,469.66	120.7	J-14189	TRUE
J-5305	B	TRUE	1,500.00	2,468.44	2,468.44	120.6	J-14189	TRUE
J-5361	B	TRUE	1,500.00	1,936.21	1,936.21	60.4	J-14189	FALSE
J-538	B	TRUE	1,500.00	2,459.56	2,459.56	114.8	J-14189	TRUE
J-5406	B	TRUE	1,500.00	2,428.94	2,428.94	94.2	J-14189	TRUE
J-5479	B	TRUE	1,500.00	1,937.56	1,937.56	60.6	J-14189	FALSE
J-5643	B	TRUE	1,500.00	2,471.60	2,471.60	120.8	J-14189	TRUE
J-5667	B	TRUE	1,500.00	1,938.18	1,938.18	58.8	J-14189	FALSE
J-5774	B	TRUE	1,500.00	2,463.18	2,463.18	120.2	J-14189	TRUE
J-5775	B	TRUE	1,500.00	2,458.95	2,458.95	120.2	J-14189	TRUE
J-5816	B	TRUE	1,500.00	2,463.35	2,463.35	115.3	J-14189	TRUE
J-5877	B	TRUE	1,500.00	2,429.94	2,429.94	94.6	J-14189	TRUE
J-5878	B	TRUE	1,500.00	2,434.07	2,434.07	93.7	J-14189	TRUE
J-5933	B	TRUE	1,500.00	2,464.56	2,464.56	86.3	J-14189	TRUE
J-5934	B	TRUE	1,500.00	2,462.83	2,462.83	86.8	J-14189	TRUE
J-6086	B	TRUE	1,500.00	1,934.38	1,934.38	60.6	J-14189	TRUE
J-6087	B	TRUE	1,500.00	1,938.05	1,938.05	60.5	J-14189	FALSE
J-6214	B	TRUE	1,500.00	2,463.85	2,467.10	105.7	J-14189	TRUE
J-6215	B	TRUE	1,500.00	2,465.42	2,465.42	105.2	J-14189	TRUE
J-6237	B	TRUE	1,500.00	2,463.66	2,465.25	69.5	J-14189	TRUE
J-6238	B	TRUE	1,500.00	2,460.40	2,460.47	97.8	J-14189	TRUE
J-6292	B	TRUE	1,500.00	2,440.96	2,440.96	98.8	J-14189	TRUE
J-6319	B	TRUE	1,500.00	2,438.03	2,438.03	96.4	J-14189	TRUE
J-6365	B	TRUE	1,500.00	2,469.66	2,469.66	120.3	J-14189	TRUE
J-6443	B	TRUE	1,500.00	2,440.02	2,440.02	101.3	J-14189	TRUE
J-6444	B	TRUE	1,500.00	1,937.54	1,937.54	58.2	J-14189	TRUE
J-6510	B	TRUE	1,500.00	2,461.55	2,461.55	104.7	J-14189	TRUE
J-6617	B	TRUE	1,500.00	2,446.68	2,446.68	104.1	J-14189	TRUE
J-6816	B	TRUE	1,500.00	1,935.72	1,935.72	67.4	J-14189	FALSE
J-6832	B	TRUE	1,500.00	2,432.79	2,432.79	94.4	J-14189	TRUE
J-699	B	TRUE	1,500.00	2,468.72	2,468.72	119.5	J-14189	TRUE
J-700	B	TRUE	1,500.00	2,467.13	2,467.13	119.3	J-14189	TRUE
J-7216	B	TRUE	1,500.00	2,442.41	2,442.41	99.7	J-14189	TRUE
J-7240	B	TRUE	1,500.00	2,465.63	2,465.63	120.4	J-14189	TRUE
J-7255	B	TRUE	1,500.00	2,432.10	2,432.10	92.9	J-14189	TRUE
J-7365	B	TRUE	1,500.00	2,449.89	2,449.89	108.8	J-14189	TRUE
J-7376	B	TRUE	1,500.00	2,452.06	2,452.06	116.8	J-14189	TRUE
J-7450	B	TRUE	1,500.00	2,432.19	2,432.19	88.5	J-14189	TRUE



**FIRE FLOW ANALYSIS**

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**FIRE FLOW REPORT**

J-7569	B	TRUE	1,500.00	2,455.83	2,455.83	119.3	J-14189	TRUE
J-7855	B	TRUE	1,500.00	1,939.34	1,939.34	75.5	J-14189	TRUE
J-7895	B	TRUE	1,500.00	2,460.52	2,460.52	94.1	J-14189	TRUE
J-7942	B	TRUE	1,500.00	2,458.29	2,458.29	119.3	J-14189	TRUE
J-8021	B	TRUE	1,500.00	1,934.06	1,934.06	63	J-14189	TRUE
J-8055	B	TRUE	1,500.00	2,434.48	2,434.48	94.6	J-14189	TRUE
J-8287	B	TRUE	1,500.00	1,939.89	1,939.89	60.8	J-14189	TRUE
J-8337	B	TRUE	1,500.00	1,938.48	1,938.48	82.2	J-14189	TRUE
J-8576	B	TRUE	1,500.00	2,459.93	2,459.93	86.7	J-14189	TRUE
J-8577	B	TRUE	1,500.00	2,460.17	2,460.17	51.3	J-14189	TRUE
J-8842	B	TRUE	1,500.00	2,459.92	2,459.92	88.3	J-14189	TRUE
J-8843	B	TRUE	1,500.00	2,463.00	2,463.00	48.3	J-14189	TRUE
J-8867	B	TRUE	1,500.00	1,939.73	1,939.73	58	J-14189	TRUE
J-8868	B	TRUE	1,500.00	1,933.91	1,933.91	61.4	J-14189	FALSE
J-8879	B	TRUE	1,500.00	1,933.70	1,933.70	60.7	J-14189	TRUE
J-9462	B	TRUE	1,500.00	2,463.66	2,463.66	89	J-14189	TRUE
J-9561	B	TRUE	1,500.00	1,943.64	1,943.64	46.8	J-14189	TRUE
J-9787	B	TRUE	1,500.00	1,939.89	1,939.89	46.6	J-14189	TRUE
J-9830	B	TRUE	1,500.00	2,459.88	2,459.88	38.8	J-14189	TRUE
J-9961	B	TRUE	1,500.00	1,933.27	1,933.93	75	J-14189	TRUE

**LITTLE AMERICA - JUNCTION TABLE  
DOMESTIC FLOWS AND PRESSURES**

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Label	Elevation (ft)	Zone	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	Head Pressure (ft)
J-538	6,805.34	B	0.00	7,108.15	131	302.82
J-699	6,795.00	B	0.00	7,108.01	135.4	313
J-700	6,794.97	B	0.00	7,108.01	135.4	313.03
J-1308	6,939.25	B	0.00	7,121.64	78.9	182.39
J-1309	6,939.27	B	0.00	7,121.64	78.9	182.37
J-1533	6,856.35	B	0.00	7,108.75	109.2	252.4
J-1534	6,856.90	B	0.00	7,108.75	109	251.85
J-2072	6,821.47	B	0.00	7,108.43	124.2	286.96
J-2089	6,936.37	B	0.00	7,121.64	80.2	185.27
J-2090	6,936.23	B	0.00	7,121.64	80.2	185.4
J-2319	6,820.64	B	0.00	7,108.43	124.5	287.79
J-2366	6,936.86	B	0.00	7,121.64	79.9	184.78
J-2367	6,936.79	B	0.00	7,121.64	80	184.85
J-2511	6,963.09	B	0.00	7,121.59	68.6	158.49
J-2512	6,962.97	B	0.00	7,121.58	68.6	158.61
J-2690	6,943.34	B	0.00	7,121.64	77.1	178.3
J-3040	6,939.44	B	0.00	7,121.64	78.8	182.2
J-3121	6,856.48	B	0.00	7,108.75	109.1	252.26
J-3122	6,856.59	B	0.00	7,108.75	109.1	252.15
J-3312	6,963.09	B	0.00	7,121.63	68.6	158.54
J-3313	6,963.16	B	0.00	7,121.63	68.6	158.47
J-3683	6,900.29	B	0.00	7,121.68	95.8	221.38
J-3684	6,900.32	B	0.00	7,121.68	95.8	221.36
J-3693	6,942.28	B	0.00	7,121.64	77.6	179.36
J-4073	6,834.10	B	0.00	7,108.13	118.6	274.03
J-4074	6,833.86	B	0.00	7,108.13	118.7	274.27
J-4252	6,909.02	B	0.00	7,121.67	92	212.64
J-4253	6,908.72	B	0.00	7,121.67	92.1	212.95
J-4448	6,935.09	B	0.00	7,121.69	80.7	186.6
J-4449	6,935.20	B	0.00	7,121.69	80.7	186.49
J-4557	6,800.38	B	0.00	7,108.31	133.2	307.94
J-4622	6,852.00	B	0.00	7,108.84	111.1	256.84
J-4623	6,852.00	B	0.00	7,108.84	111.1	256.84
J-4706	6,857.92	B	0	7,108.75	108.5	250.83
J-4740	6,794.89	B	0	7,108.01	135.5	313.11
J-4865	6,851.00	B	0	7,108.84	111.6	257.83
J-4866	6,851.09	B	0	7,108.84	111.5	257.74
J-4921	6,796.14	B	0	7,108.18	135	312.04
J-4922	6,796.10	B	0	7,108.18	135	312.08
J-5281	6,851.17	B	0	7,108.84	111.5	257.66
J-5304	6,794.63	B	0	7,107.99	135.6	313.36
J-5305	6,794.71	B	0	7,108.00	135.5	313.29
J-5361	6,964.00	B	0	7,121.63	68.2	157.63
J-5406	6,851.06	B	0	7,108.84	111.5	257.78

**LITTLE AMERICA - JUNCTION TABLE  
DOMESTIC FLOWS AND PRESSURES**

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J-5479	6,962.63	B	0	7,121.63	68.8	159
J-5643	6,794.19	B	0	7,107.92	135.7	313.73
J-5667	6,935.42	B	0	7,121.64	80.6	186.22
J-5774	6,796.00	B	0	7,108.17	135.1	312.17
J-5775	6,796.00	B	0	7,108.17	135.1	312.17
J-5816	6,804.46	B	0	7,108.16	131.4	303.7
J-5877	6,855.50	B	0	7,108.75	109.6	253.25
J-5878	6,855.75	B	0	7,108.75	109.5	253
J-5933	6,847.89	B	0	7,108.14	112.6	260.24
J-5934	6,846.98	B	0	7,108.14	113	261.16
J-6086	6,963.47	B	0	7,121.57	68.4	158.1
J-6087	6,963.54	B	0	7,121.56	68.4	158.02
J-6215	6,824.48	B	0	7,108.13	122.7	283.64
J-6292	6,845.65	B	0	7,108.60	113.8	262.95
J-6319	6,851.42	B	0	7,108.66	111.3	257.24
J-6365	6,795.44	B	0	7,108.01	135.2	312.56
J-6443	6,840.05	B	0	7,108.55	116.2	268.5
J-6444	6,968.00	B	0	7,121.40	66.4	153.4
J-6510	6,825.53	B	0	7,108.12	122.3	282.59
J-6617	6,833.40	B	0	7,108.50	119	275.1
J-6816	6,899.60	B	0	7,121.68	96.1	222.08
J-6832	6,856.00	B	0	7,108.70	109.3	252.7
J-7216	6,843.77	B	0	7,108.58	114.6	264.81
J-7240	6,795.36	B	0	7,108.04	135.3	312.68
J-7255	6,852.54	B	0	7,108.78	110.9	256.24
J-7365	6,822.47	B	0	7,108.44	123.7	285.97
J-7376	6,804.01	B	0	7,108.34	131.7	304.32
J-7450	6,852.00	B	0	7,108.84	111.1	256.84
J-7569	6,798.17	B	0	7,108.28	134.2	310.11
J-7855	6,926.83	B	0	7,121.69	84.3	194.86
J-7895	6,833.18	B	0	7,108.15	119	274.97
J-7942	6,798.00	B	0	7,108.23	134.2	310.23
J-8021	6,957.68	B	0	7,121.64	70.9	163.96
J-8055	6,855.66	B	0	7,108.74	109.5	253.09
J-8287	6,963.11	B	0	7,121.63	68.6	158.52
J-8337	6,911.48	B	0	7,121.68	90.9	210.2
J-8576	6,846.75	B	0	7,108.14	113.1	261.38
J-8577	6,846.07	B	0	7,108.14	113.4	262.06
J-8842	6,842.97	B	0	7,108.14	114.7	265.17
J-8843	6,843.12	B	0	7,108.14	114.7	265.02
J-8867	6,961.72	B	0	7,121.64	69.2	159.92
J-8868	6,961.71	B	0	7,121.64	69.2	159.93
J-8879	6,935.92	B	0	7,121.64	80.3	185.71
J-9462	6,841.48	B	0	7,108.14	115.4	266.67
J-9561	6,992.33	B	0	7,121.08	55.7	128.75
J-9787	6,993.38	B	0	7,121.14	55.3	127.76
J-9830	6,840.67	B	0	7,108.14	115.7	267.47

**LITTLE AMERICA - JUNCTION TABLE  
DOMESTIC FLOWS AND PRESSURES**

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J-10332	6,939.35	B	0	7,121.64	78.9	182.29
J-10349	6,846.29	B	0	7,108.61	113.5	262.32
J-10364	6,939.40	B	0	7,121.65	78.9	182.25
J-10369	6,804.73	B	0	7,108.16	131.3	303.43
J-10544	6,831.96	B	0	7,108.13	119.5	276.17
J-10597	6,964.79	B	0	7,121.62	67.9	156.84
J-10761	6,938.04	B	0	7,121.64	79.4	183.6
J-11104	6,925.08	B	0	7,121.69	85.1	196.61
J-11305	6,989.79	B	0	7,120.92	56.7	131.13
J-11437	6,796.65	B	0	7,108.17	134.8	311.53
J-11445	6,899.88	B	0	7,121.68	96	221.79
J-11555	6,929.37	B	0	7,121.69	83.2	192.32
J-11624	6,853.34	B	0	7,108.78	110.5	255.43
J-11687	6,938.81	B	0	7,121.65	79.1	182.84
J-11688	6,849.46	B	0	7,108.14	111.9	258.67
J-11752	6,906.01	B	0	7,121.67	93.3	215.66
J-11820	6,990.21	B	0	7,121.24	56.7	131.04
J-11876	6,807.16	B	0	7,108.37	130.3	301.2
J-12012	6,820.37	B	0	7,108.15	124.5	287.79
J-12032	6,992.58	B	0	7,121.02	55.6	128.44
J-12033	6,993.05	B	0	7,121.02	55.4	127.97
J-12166	6,850.28	B	0	7,108.85	111.9	258.57
J-12218	6,960.17	B	0	7,121.65	69.9	161.47
J-12219	6,957.56	B	0	7,121.64	71	164.08
J-12222	6,852.00	B	0	7,108.84	111.1	256.84
J-12341	6,805.64	B	0	7,108.35	131	302.72
J-12372	6,798.11	B	0	7,108.27	134.2	310.16
J-12491	6,906.00	B	0	7,121.67	93.3	215.67
J-12492	6,908.42	B	0	7,121.68	92.3	213.25
J-12584	6,941.79	B	0	7,121.64	77.8	179.85
J-12594	6,797.94	B	0	7,108.24	134.3	310.31
J-12618	6,836.00	B	0	7,108.52	117.9	272.52
J-12636	6,991.56	B	0	7,121.02	56	129.46
J-12645	6,965.93	B	0	7,121.31	67.2	155.38
J-12646	6,979.87	B	0	7,121.31	61.2	141.43
J-12855	6,853.66	B	0	7,108.68	110.3	255.02
J-12912	6,906.00	B	0	7,121.67	93.3	215.67
J-13045	6,903.47	B	0	7,121.68	94.4	218.21
J-13297	6,948.75	B	0	7,121.64	74.8	172.89
J-14053	6,994.00	B	0	7,120.81	54.9	126.81
J-14104	6,854.71	B	0	7,108.93	110	254.22
J-14263	6,878.00	B	0	7,109.75	100.3	231.75
J-14283	6,882.00	B	0	7,109.19	98.3	227.19
J-14290	6,848.00	B	0	7,108.73	112.8	260.73
J-14292	6,902.92	B	0	7,119.53	93.7	216.61
J-2691	6,943.17	B	0.015	7,121.64	77.2	178.47
J-6238	6,831.50	B	0.066	7,108.13	119.7	276.63

**LITTLE AMERICA - JUNCTION TABLE  
DOMESTIC FLOWS AND PRESSURES**

9-11-13

J-9961	6,927.98	B	0.661	7,121.69	83.8	193.71
J-6237	6,832.10	B	1.586	7,108.13	119.4	276.02
J-6214	6,823.52	B	3.255	7,108.13	123.1	284.6
J-12030	6,820.77	B	3.892	7,108.15	124.3	287.38
J-2073	6,824.81	B	4.669	7,108.43	122.7	283.62
J-14293	6,840.59	B	7.3	7,109.21	116.2	268.61
J-14288	6,876.00	B	8.5	7,109.80	101.2	233.8
J-14268	6,832.00	B	8.7	7,109.35	120	277.35
J-14267	6,868.00	B	9.7	7,109.80	104.6	241.8
J-14265	6,840.00	B	13.4	7,111.34	117.4	271.34
J-14257	6,856.00	B	15.8	7,108.72	109.3	252.72
J-14269	6,846.00	B	15.8	7,109.12	113.8	263.12
J-14287	6,856.00	B	18.8	7,111.34	110.5	255.34
J-14258	6,840.00	B	20.1	7,108.72	116.3	268.72
J-14276	6,866.00	B	21.3	7,108.73	105	242.73
J-14284	6,874.00	B	24.3	7,109.18	101.8	235.18
J-14289	6,842.00	B	27.3	7,108.82	115.4	266.82
J-14277	6,866.00	B	29.8	7,108.81	105.1	242.81
J-14275	6,852.00	B	30	7,108.71	111.1	256.71
J-14274	6,828.00	B	32.2	7,108.71	121.4	280.71
J-14259	6,830.00	B	37.6	7,108.73	120.6	278.73
J-14260	6,836.00	B	40.1	7,108.83	118	272.83
J-14261	6,866.00	B	40.1	7,108.95	105.1	242.95
J-14278	6,822.00	B	40.7	7,108.70	124	286.7
J-14280	6,842.00	B	44.3	7,108.69	115.4	266.69
J-14285	6,878.00	B	44.3	7,109.18	100	231.18
J-14264	6,854.00	B	49.8	7,110.04	110.8	256.04
J-14291	6,858.00	B	49.8	7,108.69	108.5	250.69
J-14286	6,880.00	B	55.3	7,109.25	99.2	229.25
J-14281	6,826.00	B	58.9	7,108.66	122.3	282.66
J-14279	6,852.00	B	70.4	7,108.64	111	256.64
J-14273	6,840.00	B	86.2	7,108.69	116.2	268.69
J-14271	6,844.00	B	91.1	7,108.74	114.5	264.74
J-14270	6,846.00	B	96.1	7,108.82	113.7	262.82

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[illegible]

# GRAVITY SEWER PIPE REPORT

Label	Section Size (Catalog Conduit)	Invert (Start) (ft)	Invert (Stop) (ft)	Depth (Average End) / Rise (%)	Flow (gpd)	Start Node	Stop Node
1978	42 inch	6,779.50	6,779.26	18.5	2,000,000.02	R-018	R-017
1979	42 inch	6,779.26	6,778.73	19.9	2,000,000.02	R-017	R-016-Load LA
1980	42 inch	6,778.73	6,778.49	23	2,968,182.63	R-016	R-015
1981	42 inch	6,778.49	6,778.04	22.2	2,968,182.63	R-015	R-014
1982	42 inch	6,778.04	6,777.48	24.8	2,968,182.63	R-014	R-013
1983	42 inch	6,777.48	6,777.36	24.6	2,968,182.63	R-013	R-012
1984	42 inch	6,777.36	6,776.82	20.9	2,968,182.63	R-012	R-011
1985	42 inch	6,776.82	6,776.19	20.6	2,968,182.63	R-011	R-010 Load CDR
1986	42 inch	6,776.19	6,775.50	24.6	2,977,212.54	R-010 Load	R-009
1987	42 inch	6,775.50	6,775.34	28.5	2,977,212.54	R-009	R-008
1988	42 inch	6,775.34	6,775.14	29.3	2,977,212.54	R-008	R-007
1989	42 inch	6,775.14	6,775.04	30	2,977,212.54	R-007	R-006
1990	42 inch	6,775.04	6,774.90	29.4	2,977,212.54	R-006	R-005
1995	42 inch	6,774.90	6,774.75	27.9	2,977,212.54	R-005	R-004
1996	42 inch	6,774.75	6,774.50	27.7	2,977,212.54	R-004	R-003
1997	42 inch	6,774.50	6,774.22	23.5	2,977,212.54	R-003	R-002
1998	42 inch	6,774.22	6,773.57	23.5	2,977,212.54	R-002	R-001
1999	42 inch	6,773.57	6,773.36	29.6	7,034,581.14	R-001	23-066
2000	33 inch	6,773.36	6,772.61	41.4	7,034,581.14	23-066	23-065
2001	33 inch	6,772.61	6,772.27	41.4	7,034,581.14	23-065	23-064
2002	33 inch	6,772.27	6,771.43	44.1	7,034,581.14	23-064	23-063
2003	42 inch	6,771.43	6,770.77	39.2	7,034,831.39	23-063	23-062
2004	42 inch	6,770.77	6,770.63	39.4	7,034,831.39	23-062	23-069
2005	42 inch	6,770.63	6,770.47	40	7,034,831.39	23-069	23-061
2006	42 inch	6,770.47	6,769.86	44.9	7,034,831.39	23-061	23-060
2007	42 inch	6,769.86	6,769.84	48.5	7,034,831.39	23-060	23-059
2009	42 inch	6,769.84	6,769.70	44.8	7,042,331.45	23-059	23-058
2010	33 inch	6,769.70	6,768.80	47.7	7,042,331.45	23-058	23-057
2011	33 inch	6,768.80	6,767.77	43.4	7,102,182.16	23-057	23-056
2012	33 inch	6,767.77	6,767.22	44.3	7,118,719.52	23-056	23-079
2013	33 inch	6,767.22	6,766.41	46.8	7,118,719.52	23-079	23-055
2014	42 inch	6,766.41	6,765.91	37.9	8,270,020.76	23-055	23-054
2015	42 inch	6,765.91	6,765.44	37.1	8,282,358.14	23-054	23-053
2016	42 inch	6,765.44	6,764.45	36.8	8,282,358.14	23-053	23-052
2017	42 inch	6,764.45	6,764.17	37.1	8,282,358.14	23-052	23-980
2018	42 inch	6,764.17	6,763.58	38.8	8,303,620.64	23-980	23-051
2019	30 inch	6,763.58	6,762.98	52.1	8,321,470.88	23-051	23-999
2020	30 inch	6,762.98	6,762.42	50.7	8,321,470.88	23-999	23-050
2021	42 inch	6,762.42	6,762.05	40.3	8,321,470.88	23-050	23-067
2022	42 inch	6,762.05	6,761.96	42.2	8,321,470.88	23-067	23-381
2023	42 inch	6,761.96	6,761.46	40.6	8,321,470.88	23-381	23-049
2024	30 inch	6,761.46	6,760.71	56.9	8,364,258.46	23-049	23-382



# GRAVITY SEWER PIPE REPORT

2025	30 inch	6,760.71	6,760.46	57.5	8,397,333.18	23-382	23-048
2026	30 inch	6,760.46	6,759.47	56.8	8,411,245.40	23-048	23-047
2027	30 inch	6,759.47	6,758.67	56.5	8,411,245.40	23-047	23-046
2028	30 inch	6,758.67	6,757.89	55.7	8,469,520.65	23-046	23-045
2029	30 inch	6,757.89	6,757.82	56.5	8,469,520.65	23-045	23-010
2030	30 inch	6,757.82	6,756.98	57.2	8,505,895.45	23-010	23-044
2031	30 inch	6,756.98	6,756.55	57.1	8,505,895.45	23-044	23-043
2032	30 inch	6,756.55	6,756.12	57	8,505,895.45	23-043	23-042
2033	30 inch	6,756.12	6,755.93	57	8,505,895.45	23-042	23-041
2034	30 inch	6,755.93	6,755.63	57.6	8,630,933.45	23-041	23-040
2035	30 inch	6,755.63	6,755.39	56.3	8,630,933.45	23-040	23-039
2036	30 inch	6,755.39	6,755.13	55.1	8,630,933.45	23-039	23-038
2037	30 inch	6,755.13	6,754.14	55.3	8,630,933.45	23-038	23-037
2038	30 inch	6,754.14	6,753.60	54.2	8,630,933.45	23-037	23-036
2039	42 inch	6,753.60	6,753.10	37	8,630,933.45	23-036	23-035
2040	42 inch	6,753.10	6,752.62	39.6	8,631,433.94	23-035	23-034
2041	42 inch	6,752.62	6,752.19	41	8,631,433.94	23-034	23-033
2042	30 inch	6,752.19	6,751.32	55	8,631,433.94	23-033	23-132
2043	30 inch	6,751.32	6,750.55	56.5	8,631,433.94	23-132	23-131
2044	30 inch	6,750.55	6,750.15	55.4	8,631,433.94	23-131	23-133
2045	30 inch	6,750.15	6,749.75	51.2	8,631,433.94	23-133	23-130
2046	30 inch	6,749.75	6,746.37	59.9	8,640,808.40	23-130	23-129
2047	36 inch	6,746.37	6,746.07	59.4	8,714,558.38	23-129	23-128
700	15 inch	6,769.37	6,767.57	43.1	1,151,301.01	10-425	23-055
2008	8 inch	6,774.41	6,771.78	5.9	7,500.00	23-068	23-059
1192	36 inch	6,774.50	6,774.07	26.7	4,057,368.60	8-022	R-001
1191	36 inch	6,775.00	6,774.50	26.7	4,057,368.60	8-001	8-022
1190	36 inch	6,776.05	6,775.00	25.5	4,057,368.60	8-002	8-001

# RECLAIMED WATER JUNCTION REPORT

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
354	Node-280	6,939.30	0	7,114.84	75.9
355	Node-281	6,938.00	0	7,114.83	76.5
356	Node-282	6,938.50	15	7,114.71	76.2
357	Node-283	6,935.80	0	7,114.83	77.5
358	Node-284	6,940.60	0	7,114.83	75.4
359	Node-285	6,935.80	0	7,114.96	77.5
360	Node-286	6,937.20	0	7,114.96	76.9
361	Node-287	6,941.00	0	7,114.96	75.3
362	Node-288	6,941.90	0	7,114.96	74.9
363	Node-289	6,937.90	0	7,114.96	76.6
364	Node-290	6,938.40	0	7,114.96	76.4
365	Node-291	6,785.50	0	7,075.17	125.3
366	Node-292	6,783.50	0	7,075.16	126.2
367	Node-293	6,783.50	0	7,075.16	126.2
368	Node-294	6,935.80	0	7,114.96	77.5
369	Node-295	6,937.40	0	7,114.96	76.8
370	Node-296	6,933.40	0	7,234.44	130.2
371	Node-297	6,923.80	0	7,247.96	140.2
372	Node-298	6,933.60	0	7,234.44	130.2
373	Node-299	6,895.70	0	7,266.82	160.6
374	Node-300	6,892.20	0	7,266.82	162.1
375	Node-301	6,890.70	0	7,266.82	162.7
376	Node-302	6,892.10	0	7,266.82	162.1
377	Node-303	6,917.00	0	7,302.48	166.8
378	Node-304	6,917.50	0	7,302.40	166.5
379	Node-305	6,916.00	0	7,278.24	156.7
380	Node-306	6,916.10	0	7,278.24	156.7
381	Node-307	6,919.30	0	7,266.41	150.2
382	Node-308	6,919.50	0	7,266.41	150.1
383	Node-309	6,919.40	0	7,325.69	175.8
384	Node-310	6,921.50	0	7,325.69	174.9
385	Node-311	6,924.10	0	7,325.69	173.7
386	Node-312	6,926.70	0	7,325.69	172.6
387	Node-313	6,917.30	0	7,325.69	176.7
388	Node-314	6,919.20	0	7,325.69	175.9
389	Node-315	6,924.00	0	7,325.69	173.8
390	Node-316	6,922.60	5	7,325.69	174.4
391	Node-317	6,895.60	3	7,266.82	160.6
392	Node-318	6,891.90	6	7,266.82	162.2
393	Node-319	6,919.90	0	7,302.40	165.5
394	Node-320	6,754.80	0	7,089.58	144.8
395	Node-321	6,754.80	0	7,089.58	144.8
396	Node-322	6,754.30	12	7,089.58	145.1
397	Node-323	6,763.70	0	7,093.75	142.8
398	Node-324	6,762.90	0	7,093.62	143.1

# RECLAIMED WATER JUNCTION REPORT

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
399	Node-325	6,763.70	0	7,093.81	142.8
400	Node-326	6,920.20	5	7,302.40	165.4
401	Node-327	6,748.00	0	7,090.95	148.4
402	Node-328	6,747.40	0	7,090.95	148.6
403	Node-329	6,761.00	0	7,090.33	142.5
404	Node-330	6,763.00	0	7,090.32	141.6
405	Node-331	6,759.70	0	7,090.03	142.9
406	Node-332	6,760.60	0	7,090.03	142.5
407	Node-333	6,938.00	0	7,114.83	76.5
408	Node-334	6,939.40	0	7,114.84	75.9
409	Node-335	6,760.20	0	7,089.55	142.5
410	Node-336	6,760.90	0	7,089.54	142.2
411	Node-337	6,756.40	0	7,089.32	144
412	Node-338	6,756.40	0	7,089.32	144
413	Node-339	6,806.20	0	7,075.17	116.4
414	Node-340	6,902.20	0	7,114.87	92
415	Node-341	6,862.30	12	7,114.88	109.3
416	Node-342	6,856.90	0	7,075.16	94.4
417	Node-343	6,857.00	0	7,075.16	94.4
418	Node-344	6,844.70	0	7,075.17	99.7
419	Node-345	6,857.30	0	7,075.16	94.3
420	Node-352	6,753.70	0	7,098.10	149
421	Node-353	6,753.60	0	7,097.82	148.9
422	Node-354	6,873.30	0	7,266.82	170.3
423	Node-356	6,866.50	0	7,266.82	173.2
424	Node-357	6,860.90	0	7,266.81	175.6
425	Node-358	6,882.40	9	7,114.91	100.6
426	Node-359	6,787.60	0	7,075.18	124.4
427	Node-360	6,898.40	0	7,114.87	93.7
428	Node-361	6,909.20	0	7,114.87	89
429	Node-362	6,909.30	0	7,114.87	88.9
430	Node-363	6,859.70	0	7,114.88	110.4
431	Node-364	6,859.50	0	7,114.88	110.5
432	Node-365	6,859.50	7	7,114.88	110.5
433	Node-366	6,861.60	0	7,114.88	109.6
434	Node-367	6,944.60	0	7,195.59	108.6
435	Node-368	6,945.30	0	7,194.91	108
436	Node-369	6,949.30	0	7,207.30	111.6
437	Node-370	6,948.90	0	7,207.30	111.8
438	Node-371	6,946.80	0	7,207.29	112.7
439	Node-372	6,944.20	13	7,207.25	113.8
440	Node-373	6,946.60	0	7,207.25	112.8
441	Node-374	6,946.60	0	7,207.25	112.8
442	Node-375	6,922.80	0	7,315.33	169.8
443	Node-376	6,922.00	0	7,314.82	170

# RECLAIMED WATER JUNCTION REPORT

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
444	Node-377	6,905.40	0	7,114.88	90.6
445	Node-378	6,943.40	0	7,114.84	74.2
446	Node-379	6,945.00	2	7,114.84	73.5
447	Node-380	6,921.90	0	7,252.67	143.1
448	Node-381	6,919.30	0	7,266.84	150.4
449	Node-382	6,919.30	0	7,267.21	150.5
450	Node-383	6,921.50	0	7,252.67	143.3
451	Node-384	6,919.30	0	7,266.84	150.4
452	Node-385	6,918.80	0	7,302.40	166
453	Node-386	6,917.90	2	7,302.40	166.4
454	Node-387	6,949.30	0	7,207.51	111.7
455	Node-388	6,949.30	0	7,207.93	111.9
456	Node-389	6,891.70	7	7,266.82	162.3
457	Node-390	6,953.00	0	7,114.96	70.1
458	Node-391	6,881.00	0	7,266.82	166.9
459	Node-392	6,922.40	0	7,249.50	141.5
460	Node-393	6,933.90	2	7,249.50	136.5
461	Node-394	6,854.10	0	7,266.81	178.6
462	Node-395	6,852.20	5	7,266.81	179.4
463	Node-396	7,049.90	0	7,141.65	39.7
464	Node-397	6,911.60	0	7,309.72	172.2
465	Node-398	6,924.00	0	7,313.48	168.5
466	Node-399	6,942.00	0	7,114.96	74.8
467	Node-400	6,954.80	2	7,114.96	69.3
468	Node-401	6,947.00	0	7,114.83	72.6
469	Node-402	6,854.90	0	7,114.89	112.5
470	Node-403	6,855.20	4	7,114.88	112.3
471	Node-404	6,869.30	0	7,114.87	106.2
472	Node-405	6,800.70	0	7,107.96	132.9
473	Node-406	6,797.60	0	7,100.31	131
474	Node-407	6,792.00	0	7,079.82	124.5
475	Node-408	6,788.00	2	7,075.21	124.3
476	Node-409	6,784.40	12	7,075.18	125.8
477	Node-410	6,783.10	8	7,075.15	126.4
478	Node-411	6,821.50	0	7,075.17	109.8
479	Node-412	6,864.20	0	7,075.16	91.3
480	Node-413	6,874.30	9	7,075.15	86.9
481	Node-414	6,789.00	0	7,088.92	129.8
482	Node-415	6,752.10	0	7,089.76	146.1
483	Node-416	6,782.70	0	7,090.86	133.3
484	Node-417	6,747.60	0	7,091.27	148.7
485	Node-418	6,797.70	4	7,075.18	120.1
486	Node-419	6,793.40	0	7,075.19	121.9
487	Node-420	6,787.80	0	7,075.18	124.3
488	Node-421	6,784.20	0	7,075.18	125.9

# RECLAIMED WATER JUNCTION REPORT

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
489	Node-422	6,786.40	0	7,075.20	124.9
490	Node-423	6,751.20	0	7,091.27	147.1
491	Node-425	6,878.80	0	7,325.94	193.5
492	Node-427	6,855.00	2	7,326.35	203.9
493	Node-428	6,810.10	0	7,075.18	114.7
494	Node-258	7,112.00	0	7,115.06	1.3
495	Node-80	6,856.70	0	7,125.38	116.2
496	J-1	6,750.00	0	7,091.10	147.6
497	J-2	6,836.80	0	7,326.94	212.1
498	J-3	6,922.00	0	7,249.50	141.7
499	J-4	6,880.30	0	7,325.94	192.8
500	J-5	6,856.70	0	7,326.35	203.2
501	J-6	6,876.00	0	7,123.81	107.2
502	SCA Tissue	6,880.00	152	7,123.31	105.3
503	J-8	6,758.30	0	7,333.26	248.8
917	J-101	6,750.00	2	7,331.99	251.8
920	J-102	6,925.47	0	7,114.95	82
970	J-111	6,973.95	0	7,114.63	60.9
996	J-115	6,968.45	0	7,114.63	63.2
1069	J-117	6,790.92	0	7,075.21	123
1072	J-118	6,882.00	1,980	7,069.26	81